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Towards the cross-section measurement of the charged current muon antineutrino single pion production in the T2K near detector.

The goal of the presented analysis is the cross-section measurement of the muon antineutrino single π^- production ($\bar{\nu}_\mu + N \rightarrow \mu^+ + \pi^- + X$) in the T2K near detector. This interaction mode is a background in Charged Current (CC) quasi-elastic sample in T2K oscillation analysis and its modelling needs to be constrained. The measurement will be double differential in lepton kinematics: p_μ and $\cos\theta_\mu$. The extraction of the cross-section will be done with a binned likelihood fit. Validations of the method, done with *mock data studies*, will be presented. The main background in the CC1π^- signal sample consists of events originating from neutrino CC interactions containing 1 μ^- and 1 π^+ in the final state. The selection performance, effect of systematic errors and control samples will be discussed.

Mini-abstract

Mock data studies for cross-section measurement of single pion production in the T2K near detector.

Experiment/Collaboration

T2K

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